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The MEF Speaks - Carrier Ethernet – The New Ethernet for All
By Nan Chen

From its humble 2.94Mbit/sec beginnings, Ethernet has grown to become a 10+Gbit/sec technology that spans not just the enterprise and home but the globe.

The new Ethernet is known as Carrier Ethernet, and is predicted to be part of a $20 billion business by 2007. According to IDC, it is the technology of choice for delivering new and exciting services to business, residential, and mobile customers.

The industry body responsible for the development of Carrier Ethernet, the Metro Ethernet Forum, is developing standards and certification programs that will allow seamless inter-mixing of vendors' equipment, lowering costs, and making product selection easier.

WHAT IS CARRIER ETHERNET?

Carrier Ethernet is IEEE802.3 Ethernet plus five carrier-class attributes. These five attributes or aspects of Carrier Ethernet have been standardized by many standards bodies, led by the Metro Ethernet Forum, which has driven standards development. Ever since its inception four years ago, the MEF has ratified 11 standards, or technical specifications, that define Carrier Ethernet itself. The five carrier-class attributes are:

- Scalability: Both in the number of services supported (such as E-LAN and E-Line) and of bandwidth. The key to Carrier Ethernet's attractiveness to the enterprise is its ability to vary bandwidth on demand as business needs change.
- Protection: Carrier Ethernet now offers end-to-end, 50ms network-wide restoration capability in the event of link or node failure, allowing service providers to support traditional TDM traffic, data flows tailored to suit the characteristics of a switched circuit network.
- Hard QoS: This fundamentally changes how Ethernet is delivered. Service providers can deliver CIR and EIR, so allowing Carrier Ethernet to underwrite their SLAs. It means the SP can guarantee services with greater confidence.
- TDM support: Accomplished through emulation of E1, T1 and OC3 circuit services. This allows interoperability with legacy infrastructure plus the delivery of additional services, such as voice, to customer premises. Traffic can flow just as if it were on a traditional wide area network.
- Services management: Carrier-grade service provision and OAM.

STANDARDS AND CERTIFICATION

The MEF is working to develop standards that allow carriers to mix and match equipment from various vendors, confident that they have been tested and certified to work together across vendor boundaries.

In particular, the MEF's Carrier Ethernet Certification Program, announced on April 12, 2005, is designed to ensure global equipment/services compliance to the MEF's Carrier Ethernet standards, and the eventual interoperability of Carrier Ethernet equipment and services. The result is that service providers and carriers are able to focus important resources on provider-specific testing or other needs, rather than compliance testing. Many Vendors have already passed compliance certification, with more to follow.

Any approved product or service may be labelled “Certified Compliant to MEFx” provided it has met the relevant specifications as defined by the MEF, which specifies the test procedure.

Carrier Ethernet Standards

The MEF's technical committees have completed the following standards in defining standards of the five key carrier-class attributes noted above:

- Scalability
- MEF 11 - a framework for the User Network Interface (UNI) -
- MEF 9 - a standard abstract test suite for Ethernet services at the UNI.
- Protection
- MEF 2 – a framework and requirements for delivering 50ms resiliency
- MEF 4 - Carrier Ethernet architecture framework.
- Hard QoS
- MEF 6 - definitions for E-LAN and E-Line services.
- MEF 10 - Ethernet service attributes defining UNI to UNI communications with service model and traffic management parameters to ensure the end-to-end SLA of services delivery
- TDM support
- MEF 3 - a circuit emulation service requirement and framework
- MEF 8 – an implementation agreement of circuit emulation services over Carrier Ethernet.
- Services Management
- MEF 7 – information model of element and network management systems.

Market Trends Driving Carrier Ethernet Explosion

Business Services

Bandwidth: As enterprises increasingly deploy gigabit technology internally and through the supply chain, research by analysts at RHK shows that the top driver for selecting Carrier Ethernet was higher WAN bandwidth, both for branch offices and in the data center. The key here is the ratcheting effect as the cost of local area gigabit Ethernet falls, which means more bandwidth is required between centers, and subsequently across the whole enterprise supply chain.

Compliance: Recent legislation in North America and Europe means that all enterprises, not just financial institutions and the like, have a growing requirement for storage and archiving. The requirement for disaster recovery systems is also growing, with recent tragic events underlining just how important this application is This need must be met by growth in widely-dispersed, mirrored data centers, a key application for technologies such as Carrier Ethernet.

Consolidation: As enterprises move towards greater server consolidation and virtualization, hardware resilience will grow, boosting the need for backup and mirroring.

Other business applications, including business telephony, videoconferencing, and broadcasting, in addition to the growth in broadband take-up, all drive a need for gigabit links both within and between businesses.

Residential services

Here Carrier Ethernet, with 20+Mbit/sec per subscriber, allows service providers to make triple play service offerings, which can take advantage of Carrier Ethernet, in addition to high-speed Internet access.

This means delivery of high-definition IPTV and VoD to hundreds or millions of subscribers, as well as enabling interactive video entertainment and remote learning. As the number of appliances such as TVs, DVRs and PVRs proliferates in the home, the MEF believes Carrier Ethernet is the only infrastructure that can support this growing level of demand.

Mobile services

With growing demand for third-generation mobile services comes the requirement for robust, high-speed 3G back-haul. Analysts predict that data traffic on 3G networks will surpass voice, just as it has with wired traffic.

In addition, analysts foresee growth in high speed wireless services such as WiMAX and other next generation services. In terms of volumes and revenues, Carrier Ethernet is a natural fit for these applications.

All of these broadband requirements drive the need for a new packet-friendly infrastructure, positioning Carrier Ethernet as the universal infrastructure in business, residential and mobile segments.

Carrier Ethernet is becoming universal transport to deliver ultimate broadband to business, residential and mobile customers worldwide. Its companion Certification Program is rapidly accelerating worldwide adoption of Carrier Ethernet networks and services. The MEF leads the industry to drive compliance, interoperability, and deployment of Carrier Ethernet.